CLAIMS:

1. A method to determine the spatial distribution of magnetic particles in an examination area of an object of examination with the following steps:

a) Generation of a magnetic field with a spatial distribution of the magnetic field strength such that the examination area consists of a first sub-area with lower magnetic field strength and a second sub-area with a higher magnetic field strength,

b) Change of the particularly relative spatial position of the two sub-areas in the area of examination or change of the magnetic field strength in the first sub-area so that the magnetization of the particles changes locally,

c) Acquisition of signals that depend on the magnetization in the area of examination influenced by this change, and

d) Evaluation of signals to obtain information about the change in spatial distribution and/or the movement of the magnetic particles in the area of examination,

wherein the magnetic particles are introduced into and/or are present in the area of examination in a suspension, aerosol, in the form of a powder, especially diluted, with a casing or, especially, a thin coating, present in at least one capsule, or coupled to cells, particularly white or red blood corpuscles, immune cells, tumor cells or stem cells, or to ingredients, medication, antibodies, transplants or living organisms, or in the form of a, especially liquid, precursor form.

2. A method as claimed in claim 1, characterized in that the precursor form comprises a first aqueous solution containing $FeCl_2$ and $FeCl_3$ and a second aqueous solution containing NaOH, and in that the first and second solutions come into contact and form magnetic particles in the area of examination.

3. A method as claimed in claim 1 and 2, characterized in that the magnetic particles represent superparamagnetic particles or ferromagnetic particles, particularly in the form of flakes or needles.

4. A method as claimed in any one of the preceding claims, characterized in that the area of examination is present in the lungs, sinuses or other parts of the breathing system,

in the digestive system, inner ears, bladder, vagina, mammary glands, circulation system, particularly the heart, liver, spleen, lymph system, bone marrow and especially in inflamed organs and/or tumors.

5. A method as claimed in any one of the preceding claims, characterized in that the area of examination may comprise boreholes or materials made of plastic or ceramic.

6. A method as claimed in any one of the preceding claims, characterized in that steps b) to d) are repeated at least once.

7. A method as claimed in any one of the preceding claims, characterized in that the object of examination comprises a polymer material, especially a thermoplastic polymer, or polymer blend, a polymer melt, a micro-organism, a plant, a plant component, an organism or a component of an organism.

8. A method as claimed in any one of the preceding claims, characterized in that at least a portion of the magnetic particles has anisotropic properties.

9. A method as claimed in any one of the preceding claims, characterized in that the magnetic particle is a mono-domain particle whose magnetic reversal is implemented through Brownian rotation or Neel rotation.

10. A method as claimed in any one of the preceding claims, characterized in that the magnetic particle is a hard or soft magnetic multi-domain particle.

11. A method as claimed in any one of the preceding claims, characterized in that the magnetic particles comprise hard magnetic materials.

12. A method as claimed in any one of the preceding claims, characterized in that the hard magnetic materials comprise Al-Ni, Al-Ni-Co and Fe-Co-V alloys as well as barium ferrite (BaO $6xFe_2O_3$).

13. A method as claimed in any one of the preceding claims, characterized in that the material used for encasing or coating can be degraded or dissolved thermally, chemically,

bio-chemically, by means of electromagnetic radiation or ultrasound and/or mechanically.

14. Encapsulation, containing magnetic particles.

15. Administering composition for administering of a magnetic particle composition into an examination area, comprising administering particles containing one or more magnetic particles in a first coating material, which first coating material is easily removed in conditions prevailing in the examination area.

16. Administering composition according to claim 15, wherein the first coating material is at least partly removed in less than 20 seconds after administering into the examination area.

17. Administering composition according to claim 15 or 16, wherein the first coating material is a material that dissolves in water, preferably a polysaccharide or starch.

18. Administering composition according to claims 15 to 17, wherein the administering particles comprise only one magnetic particle coated with the first coating material and wherein the diameter of the administering particle is at least 5 times, preferably at least 10 times the diameter of the magnetic particle.

19. Administering composition according to claim is 15 to 17, wherein the administering particles comprise two or more magnetic particles and wherein the two or more magnetic particles are at an average distance of at least 5 times, preferably at least 10 times the average diameter of the magnetic particles.

20. Administering composition according to claims 15 to 19, wherein the magnetic particles are individually coated with a second coating material different from the first coating material and wherein the individually coated magnetic particles are embedded in the first coating material.

21. Administering composition according to claims 15 to 20, wherein the administering particles comprise a further outer coating of a material different from the first or second coating material.

22. Administering composition according to claim 21, wherein the administering particles comprise an easy dissolvable first coating material and a more water resistant outer coating material to improve storage stability of the administering composition.

23. Magnetic particle composition having improved imaging properties which magnetic particle composition has a magnetization curve having a step change, the step change being characterized in that the magnetization change, as measured in an aqueous suspension, in a first field strength window of magnitude delta around the inflection point of said step change is at least a factor 3 higher than the magnetization change in the field strength windows of magnitude delta below or in the field strength windows of magnitude delta above the first field strength window, wherein delta is less than 2000 microtesla and wherein the time in which the magnetisation step change is completed in the first delta window is less than 0.01 seconds.

24. Administering compositions according to anyone of claims 15 to 22 or method according to anyone of claims 1 to 13 wherein the magnetic particles are a magnetic particle composition according to claim 23.

25. Method of the administering a magnetic particle composition wherein an administering composition according to claims 9 to 15 is pre-dispersed in a liquid to at least partly remove the coating and is subsequently administered into the examination area.

26. Method for administering a magnetic particle composition to an examination object, wherein the examination object is contacted with a first solution comprising ferrous and ferric ions and, before or after that, contacted with a second solution comprising a base to precipitate the magnetic particles in the examination area.

27. Method according to claim 26, wherein the first solution comprises hydrated ferrous chloride and to hydrated ferric chloride and wherein the second solution comprises sodium hydroxide.

28. Magnetic particle formation kit for use in a method according to claim 26 or 27, comprising a first container comprising a first aqueous solution of ferrous and ferric ions and a second container comprising a second basic solution.

29. Aerosol administering composition for administering of a magnetic particle composition into an examination area, wherein the particles have a diameter below 100 μm, preferably below 10μm, and wherein the particles are from a hard magnetic material.

30. Aerosol administering composition according to claim 29, wherein magnetisation reversal by Neel rotation of the magnetic particles does not take place below 5 mT.

31. Administering magnetic particle composition for investigating small vessels, comprising particles having a size at least 8, preferably at least 10 micrometer to 100 micrometer, which particles comprise a magnetic particle and optionally a coating material, which magnetic particle and optional coating material slowly degrade in the vessels.

32. Administering magnetic particle composition according to claim 31, wherein the magnetic particle is a needle shaped multi-domain particle, composed of aligned smaller particles wherein the magnetic vectors of the smaller particles are largely oriented along the needle axis and which needle shaped particle degrades to the individual small particles in the vessels.

33. Administering magnetic particle composition according to claim 31 or 32 , wherein the time to degrade the particles is at least 10 minutes.